ABSTRACT&REFERENCES

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STUDY OF THE INULIN COMPLEX OF DAHLIA ROOT BULBS OF KEN'S FLAME SPECIES AND ITS STANDARDIZATION

p. 4–9

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The literature data analysis has shown that phytopolysaccharides are perspective sources for study and development of active pharmaceutical ingredients, and can be used as new medicines or biologically active additives in future. Therefore, the obtained polysaccharide complex from the root bulbs of Dahlias "Ken's Flame" species is perspective for the further research and isolation of new pharmaceutical ingredients and substances.

Methods. *The polysaccharide complex was obtained from the Dahlia's tubers of "Ken's Flame" species. Paper chromatography method was used to identify monosaccharides of the polysaccharide complex. Quantitative determination of fructose in the complex was carried out by adsorption spectrophotometry using α-naphthol.*

Results. *Fructose and glucose were identified by standard paper chromatography after acidic hydrolysis of the polysaccharide complex in selected standard conditions. For the quantitative determination of fructose, the Dyshe reaction was used: with α-naphthol in acidic medium. The influence of boric acid and urea supplements on the optical absorption of fructose and glucose in the given reaction was studied. The polysaccharide complex hydrolysis kinetics was studied; conditions for reaction of fructose with α-naphthol in acidic medium were selected.*

Conclusions. *The standard conditions for the hydrolysis of the inulin complex were determined, followed by the identification of monosaccharides: fructose and glucose by paper chromatography method. The method of determination of fructose with α-naphthol in acidic medium for a polysaccharide complex obtained from the Dahlia's tubers of "Ken's Flame" species was developed.*

Experimental studies devoted to the inulin complex (IC) identification using chromatography, determined conditions for the reaction of fructose with α-naphthol in acidic medium, as well as conditions for IC hydrolysis, and IC standardization are presented in the article

Keywords*: phytopolysaccharides, monosaccharides, fructose, glucose, inulin, pectins, acid hydrolysis, paper chromatography, spectrophotometry, Dahlia*

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THE IMPACT OF INDOLINOREN ON HISTROTRUCTURE OF KIDNEY ON THE GLIXERROID ACUTE RENAL FAILURE MODEL

p. 10–14

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Acute renal failure is one of the most severe conditions of kidney damage. This syndrome is characterized by a sharp decrease in excretory renal function with azotemia and significant violations of water-salt homeostasis, which causes the use of diuretics.

***The aim** of the study was to investigate the effect of the new derivative 2-oxoindolin under the conditional name "Indolinoren" on the kidney histrotructure of rats with experimental glixerroid acute renal failure model.*

***Materials and methods.** Acute renal failure in the experiment was reproduced by intramuscular administration of 50 % glycerol solution in the dose of 10 ml/kg to the rats. The performed researches do not contradict the generally accepted bioethical norms, conducted in compliance with the relevant international regulations on conducting experimental research. The investigated compound "Indolinoren" was administered intragastrically in a conditional therapeutic dose of 29.5 mg/kg. As a comparator was selected the loop diuretic – furosemide (5 mg/kg).*

***Results and discussion.** The obtained data from the morphological study of renal tissue indicate a potent nephroprotective action of compound "Indolinoren". It was established that the investigated compound "Indolinoren" reduces necrosis of nephrocytes of the tubules of the main parts of the nephrons and reduces the obstruction of the lumen of the tubules by homogeneous cylinders by 1.7 times relative to the control group. On the background of the introduction of "Indolinoren", the absence of disorganization and degeneration of the nephrocytes of the distal and proximal parts of the tubules of the nephrons was noted, the number of tubules in the cortico-medullary zone and the cerebral layer was clearly reduced, manifestations of acute lesions mostly remain at the level of the renal cortex. It is established that the severity of nephroprotective effect of new substance with the nominal name "Indolinoren" on the histrotructure of kidney of rats with acute renal failure is not inferior in compare to the diuretic furosemide.*

***Conclusions**. On the model of glixerroid acute renal failure, the compound "Indolinoren" exhibits a potent nephroprotective effect, substantially reducing pathological manifestations in the nephron tubules system. The compound "Indolinoren" promotes the reduction of necrosis of nephrons, vacuolal dystrophy of the nephrotelium and obstruction of the lumen of the tubules with homogeneous cylinders. The manifestations of acute lesion remain mainly at the level of the kidney cortex*

***Keywords:** indolinoren, derivatives of 2-oxoindoline, acute renal failure, glycerol, diuretics, furosemide*

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NEW POSSIBILITIES OF USE OF OAT RAW MATERIALS FOR INVESTIGATION OF BIOLOGICALLY ACTIVE COMPONENTS IN THERAPY OF EXPERIMENTAL DIABETES

p. 14–20

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Aim of the work *is to suggest the technology of aqua dynamic extraction of bioactive substances from oat straw. The amount of the extract and the concentration of extracted substances depend on the duration of extraction process. The composition of the investigated phytocomplex is established by nuclear magnetic resonance. Fatty acids composition of the phytocomplex of the oat straw extract was studied by gas chromatography. The possibility of using a phytocomplex from an oat straw extract is shown in the study of the metabolism of myocardium lipids in experimental animals with a diabetes model.*

Methods of research: *to optimise the process of aqueous extraction of the oat straw that in prospect, with the help of dynamic character and increased temperatures, can prevail obvious disadvantages of technology offered before; in order to evaluate the differences in the content of the mixtures of the substances, received from the primary extract was noted observation H^1–NMR spectra in D_2O; was performed gas chromatographic analysis of the fatty acids spectrum in the studied phytocomplex and in the lipids of the white blood cells of the myocardium; modeling of diabetes was performed by intraperitoneal streptozotocin injection at dose of 55 mg per kilo of body weight of rats during 6 weeks.*

Results: *was developed more economically expedient approach to obtain a phytocomplex by extracting oat straw with full preservation of biologically active substances. Fatty acid composition of the phytocomplex of the oat straw extract was studied by gas chromatography. Composition of the phytocomplex of the oat straw extract was studied by nuclear magnetic resonance.*

Conclusions: *The possibility of using a phytocomplex from an oat straw extract in the study of the metabolism of myocardium lipids in experimental animals with a model of diabetes is shown*

Keywords: *Avena Sativa, straw, extraction, polyphenols, antioxidants, fatty acids, experimental diabetes*

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RESEARCH OF MOLECULAR MASS OF PROTEINS, WHICH OBTAINED BY DIFFERENT TECHNOLOGICAL METHODS OF THE CANDIDA FUNGI CELLS DISINTEGRATION

p. 21–24

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For the treatment of candidiasis, one of the most common diseases in the world, it is perspective to develop a subunit vaccine based on proteins and polysaccharides of Candida albicans and Candida tropicalis.

The aim. *Investigate the molecular weight of the proteins derived from the Candida albicans and Candida tropicalis fungal cells by various technological methods of separate disintegration.*

Material and methods. *Different methods of disintegration were used in the study, namely ultrasound, rubbing with abrasive material and freezing-defrosting.*

Results and discussion. *According to the results obtained, it was determined that in all cases, the proteins were represented by three fractions with a molecular weight of up to 10 kDa, a molecular weight of up to 75 kDa, a molecular weight of over 75 kDa, which in each case almost did not differ in quantitative content. It should be noted significant quantitative dominance of fractions of proteins with a molecular fraction of up to 75 kDa in compare with other fractions.*

Conclusion. *All investigated methods of disintegration, namely ultrasound, rubbing with abrasive material and freezing-defrosting, provide synchronous separation of the same fractions of proteins of fungal cells of Candida albicans and Candida tropicalis*

Keywords: *technology disintegration, ultrasound, rubbing, proteins, molecular weight, candidiasis, vaccine, antigen*

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PRODUCTS OF INTERACTION OF SUBSTITUTED 5-AMINOPYRAZOLES WITH α -HALOKETONES AS POTENTIAL PHARMACEUTICAL AGENTS

p. 25–28

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Aim. *Optimization of reaction of substituted 5-aminopyrazoles with α-haloketones to form annealed 2,6,7-trisubstituted 1H-imidazo[1,2-b]pyrazoles.*

Materials and methods of research. *The methods of organic synthesis, instrumental methods of organic compound analysis were used.*

Results. *A scheme for the synthesis of 2,6,7-trisubstituted 1H-imidazo[1,2-b]pyrazoles by the interaction of 5-amino-4-arylsulfonyl-3-methylthiopyrazoles* ***1a-b*** *with chloroacetone, phenacyl bromide and 2-chlorocyclohexanone was developed. In contrast to the previously described interaction of substituted 5-aminopyrazoles with chloro (N-aryl) acetamides proceeding exclusively with the release of N^1-alkylation products, in this reaction a mixture of N^1- and N^2-isomeric alkylation products is formed. The ratio of isomers depends on the nature of the reagents and, according to the 1H NMR-spectroscopy, is about 60:40 %. The developed technique allows with one of the synthetic procedure to carry out N^1-alkylation of 5-aminopyrazoles* ***1a-b*** *and the cyclization of products* ***2*** *in imidazo[1,2-b] pyrazoles* ***4a-c*** *without isolating the N^2-alkylation product. The purity of the obtained compounds is proved chromatographically, the structure is confirmed by the data of 1H NMR-spectroscopy.*

Conclusions. *Optimized reaction of substituted 5-aminopyrazoles with α-haloketones to form annealed 2,6,7-trisubstituted 1H-imidazo[1,2-b]pyrazoles for targeted synthesis of the novel agents for the pharmaceutical practice*

Keywords: *pyrazole, α-haloketones, 1H-imidazo[1,2-b]pyrazoles, synthesis, alkylation, pharmaceutical agents, NMR spectroscopy, isomerism*

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QUALITY ASSESSMENT AND STABILITY STUDY OF COMPOUNDED FUROSEMIDE SYRUP

p. 28–35

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Compounded oral preparations, made with use of manufactured products as sources of active pharmaceutical ingredients, are characterized by short beyond-use-dates due to their instability.

Aim: *The aim of this study is to investigate the physical, chemical and microbiological stability of compounded furosemide syrups within a 30 days period.*

Methods: *Batches of 5 mg/ml compounded syrups, using furosemide substance and commercial tablets (two brands) as sources of active pharmaceutical ingredients, were stored in the dark at 5±3 °C and 23±2 °C and examined at days 0, 7, 15, 23, and 30 for changes in physical (pH, formation of colour, gas, odour and changes in viscosity), chemical and microbial stability. A stress test was conducted in order to distinguish signs of chemical instability using a stability-indicating thin-layer chromatographic method. Bacterial inoculation of these samples were examined for microbial stability based on the total aerobic microbial count (TAMC<100), the total combined yeasts/moulds count (TYMC<10) and absence of Escherichia coli.*

Results: *Throughout the storage period the investigated syrups showed no extra spots on the chromatogram, no significant changes in pH, colour, odour, gas formation, viscosity. On day 30, the content (≥99.3 %) of furosemide, total aerobic microbial count (<10^2), total combined yeasts/moulds count (<10^1) in studied samples were within acceptable limits. Stressed samples showed presence of extra and diminished spots.*

Conclusions: *Extemporaneous syrups of furosemide substance and dispersed furosemide tablets, stored in glass bottles in the dark at 5±3 °C and 23±2 °C, was found to be physically, chemically and microbiologically stable for at least 30 days.*

Keywords: *furosemide, syrup, compounded preparations, in-pharmacy control, stability, quality assessment, thin layer chromatography.*

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DETERMINATION OF THE OPTIMAL PARAMETERS AND IONIZATION PRODUCTS OF RIBOXINUM

p. 36–39

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Currently, mass spectrometry is one of the most widely used rapid methods of analysis; it is used to determine the structure of both individual synthetic and natural organic compounds and their mixtures. One of the ways to determine the structure of the compound studied by this method is the automatic comparison of the spectrum registered with the bank of spectra from the computer database.

Aim. *The aim of our work is to determine the optimal parameters of ionization and study the riboxinum fragmentation in ionization with the subsequent replenishment of the library spectra of the device.*

Methods. *Mass spectrometry was applied using various systems to create both the parent and product ions with the subsequent use of the resulting data to improve selectivity and sensitivity of the method.*

Results. *As a result of the research conducted the scheme of the riboxinum fragmentation in ionization on a mass spectrometer with a triple quadrupole has been studied. The optimal parameters of the riboxinum ionization have been determined. They are as follows: the ionization mode – positive; a drying gas – 15 L/min; a curtain gas – 8 L/min; the ionization voltage – 5000.0 kV; the temperature of a drying gas – 300.0 °C; the declustering potential – 40.0 V; the focusing potential – 200.0 V; the input potential at Q0 – 10.0 V; the collision energy (Q2) – 20.0 V; the output potential from the collision chamber (Q2) – 25.0 V.*

Conclusions. *The results obtained are the basis for developing the method for the quantitative determination of riboxinum in biological samples by high-performance liquid chromatography with mass spectrometry-based detection*

Keywords: *derivatives of purine, riboxinum, biological samples, ionization, fragmentation, mass spectrometry*

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ANALYSIS OF FACTORS THAT INFLUENCE ON ORGANIZATION OF EDUCATIONAL AND PRODUCTION PRACTICE IN PREPARATION OF PHARMACY SPECIALISTS

p. 40–45

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The aim: *The aim of the study is to group and analyze external and internal factors that influence on the process of organization of educational and production practices as a component of professional training of specialists in the system of higher pharmaceutical education, and the development of a set of recommendations for its improvement.*

Methods: *To achieve the goal methods of scientific analysis were used, in particular generalization, comparison, content analysis, system and logical methods.*

Results: *The relevance of the study of the factors influencing the process of organization of teaching and production practice by the applicants of higher pharmaceutical education is proved. A grouping of internal and external factors is performed and the essence of them is revealed on the basis of classification. A set of measures aimed at improving the organization of educational and production practices at higher educational institutions (HEIs) was developed and recommended.*

Conclusion: *The main factors determining the process of organization of practice in higher educational institutions are outlined. The external and internal factors influencing the process of organization of educational and production practice are analyzed. In order to ensure the proper quality of practical training, a set of measures is recommended to improve the organization of educational and production practices in the pharmaceutical education system*

Keywords: *pharmacy, education, specialist, practice, factors, organization, quality, competence, efficiency, employment, career*

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DETERMINATION OF THE NEED FOR MEDICINAL PRODUCTS OF PLANT ORIGIN USED FOR TREATING CARDIOVASCULAR DISEASES

p. 46-50

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Aim of the study *is to determine the need for medicinal products of plant origin for the treatment of cardiovascular diseases.*

Materials and methods. *Forecasting the need for cardiac medicines ingeneral, and in medicinal products of plant origin (MP PO), in particular, is increasing as the population, life expectancy, under the influence of socio-demographic factors, and, most importantly, with the increase in the number of elderly people.*

Results.*On the pharmaceutical market of Ukraine, among medicinal products of plant origin, domestically produced drugs, which significantly reduces the cost of therapy and makes many medicines available to socially unprotected populations.*

Conclusions. *Taking into account the peculiarities of modern social and economic conditions, the inadequacy of financial drug assistance at the expense of the state budget and the need to address the problems of improving the organization of medicinal care for patients with cardiovascular pathology, we have forecasted the long-term demand for medicinal products of plant origin. An important stage in the choice of forecasting methods is the possibility of attracting the necessary number of indicators that are characteristic of the normative method, the availability and simplicity of which allow using it by specialists who do not have special mathematical training at the level of medical and pharmaceutical organizations. Prevention of diseases should be based on the implementation of government programs for prevention and promotion of health. This will improve and actively use methods of early detection of social and economic factors that are a threat to the development of diseases of the cardiovascular system*

Keywords: *medicinal products of plant origin, cardiovascular diseases, marketing research, demand*

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